Construction Safety Is a Cooperative Effort

The link between project design and construction job site safety is a concept that is being widely explored. In July 2007, the National Institute for Occupational Safety and Health (NIOSH) hosted the first Prevention through Design workshop as a prelude to a national effort to eliminate occupational hazards and control risks to workers early on in a construction project.

OSHA is also taking part in this effort. It has formed a partnership with the American Society of Civil Engineers to promote safety through design. Their Design for Safety workgroup has developed a number of instructional presentations outlining how to achieve this objective. They also maintain a web site at www.designforconstructionsafety.org.

These efforts are the result of some prominent academic research. In a 2006 study titled *An Analysis of Construction Accidents from a Design Perspective*, researcher Michael Behm, Assistant Professor in the Occupational Safety Program at East Carolina University, analyzed 450 reports of construction workers' deaths and disabling injuries obtained from OSHA and NIOSH. His purpose was to determine if a proactive approach to safety in project design could have prevented the incidents. What he discovered was that in 151 cases, the hazard that precipitated the incident could have been eliminated or reduced if designing for safety measures had been incorporated into the plan.

When project designers use a designing for safety approach, they address features of a project that impact on construction worker safety. Examples of this in Behm's study include deigning parapet walls to be at least 42 inches high, which act as a guardrail to prevent workers from falling; alerting construction company management to the safety hazards at the work site; and noting on contract drawings of the location of existing overhead power lines.

Designing for safety is a natural outcome of the Hierarchy of Controls methodology used by safety professionals. This approach focuses on finding ways that are inherent in the project itself to reduce or eliminate workplace hazards before relying on external factors, such as personal protective equipment or administrative controls. Practitioners of the Hierarchy of Controls philosophy believe that waiting until construction begins substantially limits your risk abatement options to those that provide the lowest amount of protection.

As of a result of his research, Behm made the following recommendations:

1. The construction industry should implement the concept of designing for construction safety as a standard practice to reduce safety risks. However, implementing the design-for-safety concept is only one element in a systems approach for preventing injuries and deaths among construction workers. The contractor must continue to play a critical role in ensuring worker safety and must adhere to the design-for-safety specifications.
2. Designers should include fall protection in specifications for roofs, skylights, and structural steel construction.
3. Designers should include barriers and other measures that prevent contact with electrical and other utilities.
4. Designers should consider incorporating design-for-safety measures in all types of projects, including residential, commercial, and industrial, as well as new projects, renovations, and demolitions.
5. Root-cause accident analysis and other accident investigations should routinely consider whether design-for-safety modifications could have prevented the incident. As safety professionals demonstrate the link between the design-for-safety concept and construction incidents, they will drive its implementation as a method to reduce overall project risk.